UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,385	11/21/2003	Margot O'Toole	031896-90000 (AM1000863)	2575

22204 7590 02/11/2005

NIXON PEABODY, LLP
401 9TH STREET, NW
SUITE 900
WASHINGTON, DC 20004-2128

EXAMINER	
KIM, YUNSOO	
ART UNIT	**PAPER NUMBER**
1644	

DATE MAILED: 02/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/719,385	O'TOOLE ET AL.	
	Examiner	Art Unit	
	Yunsoo Kim	1644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) *1-8,15,16 and 26-53* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-13 and 17-25* is/are rejected.

7)☒ Claim(s) *14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The examiner of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Yunsoo Kim, Art Unit 1644, Technology 1600.

2. Applicants' Response to Restriction filed on 12/6/04 has been entered.
Claims 1-53 are pending.

3. Applicants' election of Group II with traverse, claims 9-14 and 17-25, drawn to a polypeptide and a pharmaceutical composition is acknowledged.

The restriction is traversed on the basis of MPEP 803, the distinctly claimed inventions should be examined without imposing search burden. Because the claimed inventions are distinct, they require non-coextensive searches including literature searches. As art read on antibody differs from art read on method of screening, it is an undue burden to search more than one invention. The restriction requirement is still deemed proper and is therefore made FINAL.

Accordingly, claims 1-8, 15-16 and 26-53 are withdrawn from the further consideration by the examiner 37 CFR 1.142(b) as being drawn to nonelected invention.

Claims 9-14 and 17-25 drawn to a polypeptide are under consideration in the instant application.

4. Applicants' claim for domestic priority under 35.U.S.C. 119(e) is acknowledged.

5. Applicants are invited to provide the references for consideration.

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 9-13 and 17-25 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a polypeptide consists of amino acid sequence or SEQ ID NO:2, does not reasonably provide enablement for a polypeptide comprising an amino acid sequence at least 95% identical to the amino acid sequence of SEQ ID NO:2; or at least 98%; or at least 99% or a polypeptide comprises the amino acid sequence of SEQ ID NO:2; or a polypeptide comprising any rapamycin binding domain of SEQ ID NO:2; or a polypeptide at least 1740 amino acid in length comprising at least five contiguous amino acids of SEQ ID NO:2; or a polypeptide comprising at least 5 contiguous amino acids of SEQ ID NO:20 at least 50 amino acids in length; or at least 100 amino acids in length; or at least 220 amino acids in length . The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and /or use the invention commensurate in scope with these claims.

The specification does not enable one of skill in the art to practice the invention as claimed without undue experimentation. Factors to be considered in determining whether undue experimentation is required to practice the claimed invention are summarized *In re Wands* (858 F2d 731, 737, 8 USPQ2d 1400, 1404 (Fed.Cir.1988)). The factors most relevant to this rejection are the scope of the claim, the amount of direction or guidance provided, the lack of sufficient working examples, the unpredictability in the art and the amount of experimentation required to enable one of the skilled in the art to practice the claimed invention.

There is insufficient guidance in the specification as filed as to how the skilled artisan would make and use the polypeptide recited in the instant claims. A person of skill in the art would not know which sequences are essential for rapamycin binding, and what particular lengths identify rapamycin binding sequences. There is insufficient guidance to direct a person of kill in the art to select particular sequences or sequence lengths as essential for a peptide to bind rapamycin. Without detailed direction as to which polypeptide sequences are essential to bind rapamycin, a person of skill in the art would not be able to determine which polypeptide binds rapamycin without undue experimentation.

Furthermore, Applicants has no working examples demonstrating polypeptides which are at least 95%, 98%, or 99% identical to SEQ ID NO:2, or polypeptides share at least 5 contiguous amino acid sequence of SEQ ID NO:2 bind rapamycin.

Attwood (Science 2000; 290:471-473) teaches that "[i]t is presumptuous to make functional assignments merely on the basis of some degree of similarity between sequences. Similarly, Skolnick et al. (Trends in Biotech. 2000; 18(1):34-39) teach that the skilled artisan is well aware that assigning functional activities for any particular protein or protein family based upon sequence homology is inaccurate, in part because of the multifunctional nature of proteins (e.g., "Abstract" and "Sequence-based approaches to function prediction", page 34). Even in situations where there is some confidence of a similar overall structure between two proteins, only experimental research can confirm the artisan's best guess as to the function of the structurally related protein (see in particular "Abstract" and Box 2). The complexity of the problem of assigning function based on homology rises as the percent similarity or identity falls (see Whisstock et al., Quarterly reviews of Biophysics, 2003, 36:307-340, particularly the sentence that spans pages 321 and 323). Given that the specification does not clearly indicate the rapamycin binding domain of amino acid sequence of SEQ ID NO:2, a skilled artisan would not expect any sequence sharing less that 100% identity with amino acid sequence of SEQ ID NO:2 to retain the rapamycin binding domain. As such, a skilled artisan would be unable to make and use the full breadth of applicant's claimed polynucleotide sequences without undue experimentation.

Finally, even single amino acid differences can result in drastically altered functions between two costimulatory proteins. For example, Metzler et al. (Nature Structural Biol. 1997; 4:527-531) show that any of a variety of single amino acid changes can alter or abolish the ability of CTLA4 to interact with its ligands CD80 and CD86 (e.g., summarized in Table 2). Thus it is unpredictable if any functional activity will be shared by two polypeptides having less than 100% identity over the full length of their sequences.

To summarize, reasonable correlation must exist between the scope of the claims and scope of the enablement set forth. In view or the quantity of experimentation necessary, the limited working example, the unpredictability of the art, the lack of sufficient guidance in the specification, and the breath of the claims, it would take undue trials and errors to practice the claimed invention.

8. Claims 9, 11-13, 18-20 and 22-25 are rejected under 35.U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors at the time the application was filed, had possession of the claimed invention.

Applicant is in possession of a polypeptide consisting of SEQ ID NO:2; however, applicant is not in possession of a polypeptide comprising an amino acid sequence at least 95% identical to the amino acid sequence of SEQ ID NO:2; or at least 98%; or at least 99% or a polypeptide comprises the amino acid sequence of SEQ ID NO:2; or a polypeptide at least 1740 amino acid in length comprising at least five contiguous amino acids of SEQ ID NO:2; or a polypeptide comprising at least 5 contiguous amino acids of SEQ ID NO:20 at least 50 amino acids in length; or at least 100 amino acids in length; or at least 220 amino acids in length. There are $6.2X10^{38}$ possible combinations of amino acid sequences for at least 95% identical to SEQ ID NO:2 and $6.1X10^{64}$ possible combinations of amino acid sequences for polypeptide at least 1740 amino acid in length comprising at least five contiguous amino acids of SEQ ID NO:2.

Consequently, conception in either case cannot be achieved until a representative description of the structural and functional properties of the claimed invention has occurred, regardless of the complexity or simplicity of the method. Adequate written description requires more than a mere statement that it is part of the invention. See Fiers v. Revel, 25 USPQ2d 1601,1606 (CAFC 1993).

Vas-Cath Inc. v. Mahurkar, 19 USPQ2d 1111, makes clear that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the written description inquiry, whatever is now claimed." (See page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." (See Vas-Cath at page 1116). Consequently, Applicant was not in possession of the instant claimed invention. See University of California v. Eli Lilly and Co. 43 USPQ2d 1398.

Applicant is directed to the Revised Interim Guidelines for the Examination of Patent Applications Under the 35 U.S.C. 112, ¶ 1 "Written Description" Requirement, Federal Register, Vol. 66, No. 4, pages 1099-1111, Friday January 5, 2001.

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 9 –12, 17 and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Bodary et al. (US PG-Pub, US 2004/0258678, February 2002).

Bodary et al. teach a polypeptide sequence at least 99.2% identical to the amino acid sequence of SEQ ID NO:2. Bodary et al. also teach protein compositions for diagnosis and treatment of immune related diseases (see abstract).

Applicant is reminded that no more of the reference is required than that it sets forth the substance of the invention. Ability to bind rapamycin would be inherent property of a polypeptide at least 95% identical to the amino acid sequence of SEQ ID NO:2. Thus, the reference teachings anticipated the instant claimed invention.

11. Claims 9 –11, 17 and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Tang et al. (US PG-Pub, US 2002/0197679, June 2000).

Tang et al. teach a polypeptide sequence at least 98.8% identical to the amino acid sequence of SEQ ID NO:2. Tang et al. further teach a buffer composition comprising an amino acid sequence of SEQ ID NO:2 (see p. 5, [0059]).

Applicant is reminded that no more of the reference is required than that it sets forth the substance of the invention. Ability to bind rapamycin would be inherent property of a polypeptide at least 95% identical to the amino acid sequence of SEQ ID NO:2. Thus, the reference teachings anticipated the instant claimed invention.

12. Claims 17 and 20-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Pompejus et al. (US PG-Pub, US 2003/0049804, March 2000).

Pompejus et al. teach a polypeptide sequence at least 5 contiguous amino acids of SEQ ID NO:2 with 285 amino acids in length.

Applicant is reminded that no more of the reference is required than that it sets forth the substance of the invention. Ability to bind rapamycin would be inherent property of a polypeptide comprises at least 5 amino acids of SEQ ID NO:2. Thus, the reference teachings anticipated the instant claimed invention.

13. Claim 14 is free of art.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yunsoo Kim whose telephone number is 571-272-3176. The examiner can normally be reached on Monday thru Friday 8:30 - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Chan can be reached on 571-272-0841. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yunsoo Kim
Patent Examiner
Technology Center 1600
January 28, 2005

Patrick J. Nolan, Ph.D.
Primary Examiner
Technology Center 1600
January 28, 2005